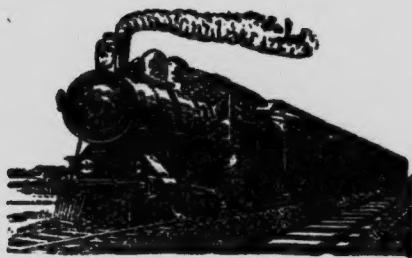


Dominion School Telegraphy and Railroading

Toronto, Ontario



**Practical Instructions and Special Lectures in
RAILROAD AND COMMERCIAL TELEGRAPHY
FREIGHT, TICKET, BAGGAGE AND
GENERAL STATION WORK**

Second Edition

Instruction Paper with Test Questions

Telegraphy

Part I

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Joseph Edward Cassan at the department of Agriculture.
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HOW TO STUDY.

1. The lessons are divided into parts and numbered, and are only supplied to the student as he progresses with his studies. Study a few pages at a time. Do not skip from one section of the paper to another. If there are any statements you do not understand, ask the instructor, or drop us a card or letter, advising what section and page you are having difficulty with, and we will explain the matter in detail. Review thoroughly, and write out the answers to the test questions at the end of this paper, and send or hand in your work for criticism. Your class letter and number is given you on your certificate of enrollment, and it is important that you put this on your examinations, as well as any letters you write to the schools. Failing to write this on, will cause delay in answering letters or returning examination work. Send one examination at a time. Don't write out the examination questions themselves. Use the number of the questions and write out your answer. In writing the answers, simply head your paper thus:—

Answers to Test Questions. Telegraphy Part 1.

John Smith, G.D. 215,

440 Delaware Ave.,

Nov. 30/10.

Toronto, Ont.

2. We desire to get in close touch with you in your studies, and would ask that you keep us informed regarding your progress and any difficulties you may meet with in your studies.

RE
305 1 1
DSK
PT 1

INTRODUCTION.

3. Telegraphy is an art, and, like every other art, requires a great deal of the right kind of application. When you realize that the foundation of the work depends upon a thorough memorization of the Morse Telegraph Alphabet, numbers and punctuation code, together with constant practice on the telegraph instruments, you will see at once the necessity of following the studies as outlined in the instructions that are to follow.

4. After many years of practical experience on the railways, together with years of school experience, we have found it necessary to prepare special instruction papers, and we feel that our efforts in this line have been amply repaid, and that students can accomplish much quicker results from these specially prepared instruction papers, than from any other medium of text-book instruction.

5. The instruction that follows will bear out strictly in practical routine work in both railroad and commercial offices, applicable to the new Canadian standard rules and regulations. The train rules will be numbered in the same way as they would be found in the railroad Rule Book, in order that the rules laid down by the school will be exactly the same as laid down by the railway companies.

6. As beginners and students, we cannot impress upon you too much the importance of having confidence in yourself to get results, and endeavor to place yourself at all times in the proper attitude, whereby you will try to accomplish the study that you are about to undertake. You will appreciate this advice more as you progress with your studies, for the time will come when it will be necessary for you to put into action your knowledge of this study, and it is in this particular instance that your constant and earnest application to your studies will prove most valuable to you in giving you that necessary confidence to assume the duties of a responsible position immediately upon graduating.

INSTRUCTION FOR BEGINNERS.

7. In beginning the study of telegraphy, we assume that the student knows nothing at all about the subject, and that he has carefully read over the introduction that precedes this lesson. The study is quite simple, if proper methods of work and study are carried out right from the beginning. Any person can learn telegraphy, but the best time to undertake the study is between the ages of 15 and 35. To become a first-class telegrapher requires careful methodical study, and drill on the practical application of the various symbols on the instrument's. Great results cannot be expected through little labor.

8. No other trade, or profession offers the same inducements in the way of quick returns, nor yet offers the same opportunities for employment and advancement. When you realize that the average time to complete the study is six months, and at that time a man is qualified to make a larger income than a man who spends four years in learning a trade, you will see at once the importance of getting the right foundation, and we trust that this first instruction paper will be studied very carefully.

9. Telegraphy is the stepping stone to many of the important positions in the railway service, such as Despatchers, Chief Despatchers, Train Masters, Superintendents, Managers and General Managers. Therefore, our advice is that if you are only studying telegraphy, that you would use it as a stepping stone to something better, in order that you may feel that you are advancing yourself year by year, until you have attained the goal of your ambition.

10. In this instruction, we purpose taking up the subjects in the order that they should be taken up, and not start at once to talk about the duties of a telegrapher at a station or in a commercial office, but on the contrary, this will be taken up at the proper time, so that you may grasp the subject by easy steps, paper by paper, until you have mastered the entire course.

11. The first step in the actual study is to memorize the Morse Alphabet, numerals and practical punctuation code. This may be done alone. First memorize the code in alphabetical order, and study page by page, the same as if each leaf were handed to you one at a time. It is important that you familiarize yourself with the dots, dashes and spaces, so that they will seem as natural to you as it is to listen to a person talking.

THE TELEGRAPHIC CODES.

12. We give below in convenient form the characters in the Morse Code, representing the letters in the English alphabet, the numerals and the practical punctuation code, which is known as the Phillips Code. These are the characters in common use in Canada and the United States.

First learn the alphabet mentally. Here it is:—

THE MORSE ALPHABET.

A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	
R	S	T	U	V	W	X	Y	
Z	&							

13. In memorizing this, begin with A, and repeat to yourself over and over, "A, dot dash, A, dot dash, etc." B, dash dot dot dot, etc., and so on through all the alphabet. Note the space in C, O, R, Y, Z, and short &. After going over each letter several hundred times, take a pencil and paper and write them out in the same way, taking pains to make the spaces upon the paper and also the lengths of the dots and dashes, and write out symbols from words given in other paragraphs in the book.

NUMERALS.

14. After having memorized the alphabet mentally, take up the same plan with the numerals:

1	2	3	4	5	6
7	8	9	0		

PRACTICAL PUNCTUATION CODE.

15. After memorizing the two preceding exercises, take up the following exercise, and memorize this in the same way. In everyday work the period, comma and interrogation will be found more often than others in the punctuation code; in fact many operators have seen service for years without becoming acquainted with any others, but we wish the student to learn the others at the same time he is learning these, in order that he will not be obliged to go back and review them when he comes to the more advanced studies. The decimal point is usually transmitted ., spelling out the word dot. This applies particularly to the point between Dollars and Cents. The fraction is made by putting the letter E between the numerals, representing the fraction. The sign of Dollars is frequently used.

Period	.	-----
Comma	,	-----
Interrogation Mark	?	-----
Dollars	\$	-----
Cents	c	-----
Quotation (at beginning)	"	-----
Quotation (at end)	"	-----
Decimal Point	.	-----
Fraction line	—	-----

THE PHILLIPS PUNCTUATION CODE.

15A. Outside of the practical punctuation code, the exclamation, dash, and shilling marks of this code are the only ones used in railroad work.

The exclamation is used as a mere matter of something for the sending operator to do when he has made a mistake, and is surprised at himself for doing so, or on the other hand, for the receiving operator when someone interferes with the wire, preventing him from getting the message that is being sent to him. This would happen when the operator at Montreal would be sending a message to the operator at Toronto, and the operator at Belleville, not having his instrument adjusted, would break in on the circuit and interfere. The operator at Toronto would

probably hear him doing this and would make the mark of exclamation, telling the operator at Belleville that he is breaking, and then tell the operator at Montreal to go ahead.

The "dash" is used more often by spelling out the complete word than "DX," and in fact some operators spell out the word "stroke" instead of "dash." To illustrate: In the body of a message reading, Your way-bill 7-325 December 1st reads, etc. The hyphen there is usually spelled out by writing the word "dash" and sometimes "stroke."

The shilling mark is used by many of the good operators instead of dash, as it is much quicker to write UT, than it is s-t-r-o-k-e or d-a-s-h.

Note.—The Phillips Code is used expressly for newspaper work and stock brokers, and is only given here for reference. It is not necessary for a student to study it, as the practical punctuation code is all that is needed for the present.

THE PHILLIPS PUNCTUATION CODE.

. Period	-----
, Comma	-----
	K O
: Colon (KO)	-----
	K X
:— Colon dash (KX)	-----
	S I
; Semicolon (SI)	-----
? Interrogation	-----
! Exclamation	-----
— Fraction Line (E)	-----
	D X
— Dash (DX)	-----
	H X
. Hyphen (HX)	-----
	Q X
'Apostrophe (QX)	-----

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\$ Dollars (SX)	S	X		
	---	---		
c Cents (C)	C			

£ Pound sterling (PX)	P	X		
/ Shilling mark	---	---		
	D			
d Pence (D)	---			
. Decimal Point	---	---		
	C	X		
Capitalized letter (CX)	---	---		
¶ Paragraph	---	---		
	K	Q		
: " Colon followed by quotation (KQ)	---	---		
	P	N	P	N
() Parenthesis (PN)	---	---	---	---
or	P	N		
(at beginning (PN)	---	---		
	P	Y		
) at end (PY)	---	---		
	Q	N	Q	N
" " Quotation (QN)	---	---	---	---
or	Q	N		
" at beginning (QN)	---	---		
	Q	J		
" at end (QJ)	---	---		
" ' ' ' Quotation within a Quotation (QX)	Q	X	Q	X
	---	---	---	---
	U	X		
Underlines or italics (UX)	---	---		
or	U	X		
at beginning (UX)	---	---		
	U	J		
at end (UJ)	---	---		
	B	X	B	X
[] Brackets (BX)	---	---	---	---

DOTS, DASHES AND SPACES.

16. The Morse Code is not made up of dots and dashes of different length, but is based upon a perfect time system, which is known as the **unit system**, the dot being taken as the unit of time for the formation of the remaining letters, numerals and punctuations and thus by being based upon a perfect system, it matters not whether the transmission be slow or fast, if the length of time for making the dots, dashes and spaces be increased or decreased for all characters alike, the transmission will remain perfect. As the time of the dot is taken as the unit of time for the formation of the remaining signals, their relative values are as follows:—

Signal.		Duration of Signal.
	1	
Dot	-	1 unit
	3	
The dash	—	3 units
	6	
The long dash (L)	——	6 units
	9	
The extra long dash (cipher)	———	9 units
	1	
Space between parts of a letter	— —	1 unit
	2	
Space in spaced letters	— —	2 units
	3	
Space between letters	— —	3 units
	6	
Space between words	— — —	6 units

17. From the foregoing table, the student will notice that the Morse Code is made up of four elements, the dot, the dash, the break, and the space, arranged in different combinations. Also that some of the letters are not composed of dots entirely, but a mixed combination of dots, dashes and spaces. It will be noticed that there are four lengths of spaces and three of dashes.

SHORT METHOD OF MEMORIZING.

18. In the first part of this instruction we advised you to memorize the alphabet in the regular order, but in this particular case we wish to call attention to a short method of memorizing these characters, so that they will not be in alphabetical order, and in this way they will be called to mind at will. In fact, you should so memorize each letter, that no matter what word you are writing out, the characters would not have any effect on your memory, and that you would not hesitate any more on one, than you would on the other. The various characters should be thoroughly memorized before ever attempting to write them on the key, and it is important that you confine yourself particularly to this book, before starting the practice work on the instruments. By grouping the letters in the following manner, you will find you can learn them more readily and with less labor:

DOT CHARACTERS.

E I S H P 6

.....

19. The dot characters are found to occur more frequently than any other letters, and yet they are the most simple to learn, as it will be noticed that they appear in numerical order, E being one dot, I two dots, S three dots, etc. At this time we wish to remind you that in calling the characters off, instead of saying for II, dot dot dot dot, simply say four dots; P five dots, following the idea through the balance of the exercises in order to save time.

SPACED CHARACTERS.

20. In writing and memorizing these, say to yourself as follows:—O, dot space dot; C, two dots space dot; R, dot space two dots, etc.

O C R Y Z &

.....

DASH CHARACTERS.

T	L	M	5	O
---	---	---	---	---

21. Notice L is twice the length of T, or six units. The cypher is three times the length of T, or nine units.

DOT-AND-DASH CHARACTERS.

A	U	V	4
---	---	---	---

22. In repeating these mentally, say for U two dots dash; V, 3 dots dash; 4, four dots dash.

DASH-AND-DOT CHARACTERS.

N	D	B	8
---	---	---	---

23. It will be noticed these are the reverse of the dot and dash characters, and in repeating them mentally you would say for B, dash three dots; 8, dash four dots. After the student has thoroughly memorized the preceding characters, the balance of the alphabet, numbers and practical punctuation code which are represented herewith, should be memorized in the same short method, and it is expected that in the Day School the student will be required to go over these exercises with the instructor.

MISCELLANEOUS CHARACTERS.

F	W	G	K	Q	3
---	---	---	---	---	---
J	X	2	1	7	9
---	---	---	---	---	---

24. It will be noticed that the above characters complete the alphabet and numerals. In repeating them mentally, you would say for 3,—three dots dash dot; 2,—two dots dash two dots, etc.

HELPFUL HINTS.

25. No duties devolve upon an operator which persons with ordinary ability cannot perform, if they give careful thought and study to this instruction, which is no more than is expected from any one who wishes to succeed in any profession of life. No business or profession can be learned in a day. Telegraphy requires much careful thought and practice, together with untiring application.

26. This first instruction paper being the foundation of the work, is most important, and the various suggestions already mentioned should be thoroughly reviewed from time to time. Don't expect to absorb telegraphy. If it is worth learning at all, it is worth learning well, and the ground work in this lesson should be thoroughly mastered before proceeding with the next paper. Never leave a point or lesson until you have completely mastered it and have it thoroughly fixed in your mind, and the better your memory is trained to recall the different telegraphic symbols, the more rapid will be your progress. There always has been and always will be a great demand for competent telegraphers. Success in life depends upon being ready when the opportunity comes.

DEFINITIONS OF TERMS USED IN TELEGRAPHY.

27. Before explaining the telegraphic apparatus, we wish to give a few definitions of terms usually used in connection with the work.

28. **Telegraphy** is the art of making or transmitting signals, composed of dots and dashes, whereby communications are sent between two or more places by means of telegraphic instruments.

29. **Electricity** is a polar force, which becomes discernible by its peculiar phenomena of attraction and repulsion. It is derived from the Greek word signifying "amber," the body on which it was first discovered when rubbed upon fur, wool or

silk, acquiring the property of attracting light objects. The property of electricity will be described as the power of attraction and repulsion. It is developed in two ways, by chemical action and by friction.

30. The **electric circuit** is a path or wire through which an electric current flows from a starting point, around through the path and back again to the starting point. This circuit is said to be open when the path at any point is broken, preventing the return flow of the electricity. The amount of electricity is the same in all parts of the circuit through which it is flowing. It may be likened unto a rubber hose through which water is flowing. Any one stepping on a hose is a simple illustration of what is termed in electricity as resistance. A **dynamo** is an electrical machine which generates electricity when driven by a steam engine or some other power. It is used in large offices instead of batteries, and is very much better on account of it furnishing a current of uniform strength, while the current obtained from batteries depends upon their working condition.

31. **The Earth as a Return Circuit.** All telegraph companies use the earth as a return path for the electric current, thus saving the expense of constructing and maintaining separate return wires for each circuit. The earth containing moisture, conducts the flow of current in the same way as a wire would. • Therefore, if a pole or battery is connected with the earth, and a wire from the other pole is carried to some distant place and there connected with the earth, a current will flow through the circuit about as readily as if it had been completed by a large wire. On short lines, however, especially indoor lines, it is generally more convenient to run two wires, than to make earth connections. A wire connected to water or gas pipes will make direct connection to the earth.

32. **Magnetism** is that form of electricity which exists in the magnet or load stone.

33. **Electrical Magnetism** is that force in nature which is developed by the influence of electrical currents. The natural magnet is an iron ore, known as "load stone," while the artificial magnet is a bar of steel magnetized by artificial means. To illustrate:—If you were to take a bar of very soft iron and wrap around it a number of feet of insulated wire, and then connect the two ends of the poles of one or more cells of the battery, so that the electric current will flow around the soft iron bars many times, the iron bar will become **magnetic**, that is, will have the power of attracting and lifting to its ends any small pieces of iron or steel that may be placed close to them.

34. A bar of very soft iron wound with a large number of turns of insulated wire, is called an **electro magnet**.

DESCRIPTION OF TELEGRAPH APPARATUS.

35. There are four principal parts to a telegraph outfit, as follows:—

- (1) The battery or dynamo which produces or generates the electric current.
- (2) The wire which carries or conducts the electric current.
- (3) A key for making the electrical connections.
- (4) The receiving instrument called the Sounder, which gives out in sound all the signals that are made on the key that is connected in the same electric circuit with it.

In connection with the above parts, a Relay is used on all long lines, which will be explained more fully further on.

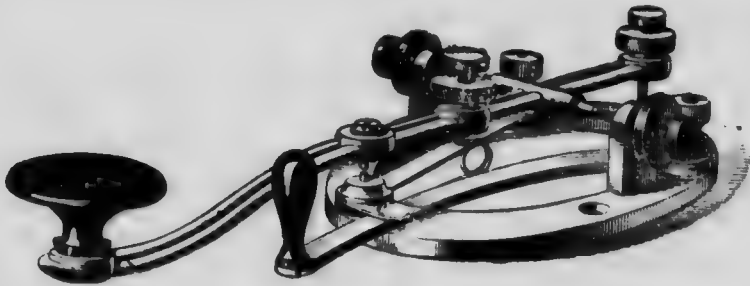


Fig. 1.

36. **The Telegraph Key** is an instrument for opening and closing a telegraph circuit. A good key is shown in Figure 1. You will notice the lever is equipped with a hard rubber handle on one end, and an adjustment screw on the other. The screw is kept in place with a lock nut. About the middle of this lever you will notice there are two platinum points, where the instrument makes the electrical circuit or connection, and it is on these points that the dots and dashes are made. The lower point on the frame of the instrument is insulated. The key frame itself is connected to one side of the battery, the insulated point is connected to the sounder. Telegraphy is accomplished by the making and breaking of the contact between the two platinum points. A switch is fastened to the frame and is equipped with a hard rubber knob. This switch is usually called the circuit closer. When used on a circuit with dry batteries, it should always be left wide open. When receiving, the switch should be closed, and when sending it should be open. There is a spring underneath the lever of the key which connects the two points, and you will notice in making any telegraph character, it is necessary to press these points together, and the moment you release the pressure, the spring raises and disconnects the current. The platinum points should always be kept perfectly clean and free from grease and dirt. Sometimes it is found necessary to close the switch, take the lever off, and use a very smooth oil stone on the two platinum points in order to get them to work perfectly.

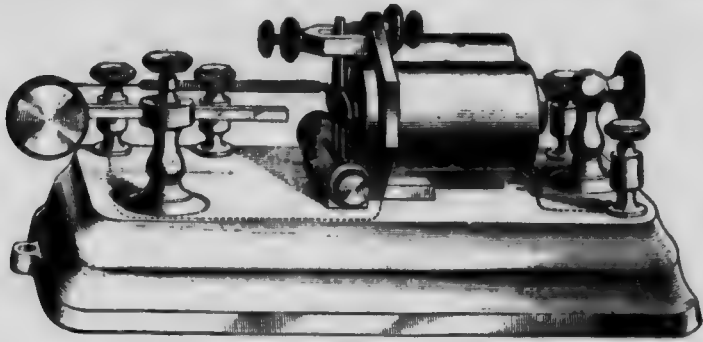


Fig. 2.

37. **The Relay**—A relay is a telegraphic receiving instrument having an armature that moves in accordance with impulses of currents that pass through the coil on the magnet cores of the instrument, and in so moving, opens and closes a second circuit, called a local circuit, in which may be included a sounder. The relay will work with a very weak current. These relays are used when the telegraph line is more than about 30 miles in length—as it is difficult to get the sounder to work with sufficient vigor to produce a loud enough sound.

38. The use of the relay is to assist all over production of current. It consists of an electro magnet, horizontally arranged on a wood or metallic base.

The Relay is a main line instrument, i.e., it is used in a regular railroad or commercial office. See fig. 2.

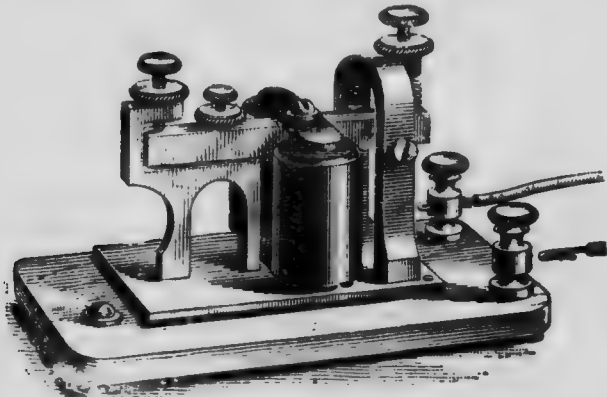


Fig. 3.

39. **The Sounder** is an electro-magnet so constructed that it gives forth sounds that correspond to the up and down motion imparted to a key that is connected in the same electrical circuit with it. It is sometimes called the instrument employed in receiving messages, and is usually adjusted to suit the operator. We recommend that the Sounder be left as it is, for it is usually tested before it is sent out from the factory.

40. The current coming from the key, flows through the magnet wire that is wound around the soft iron cores and magnetizes them. These cores are commonly called spools. This attracts the armature or what may be commonly called the lever of the sounder. As soon as the contact becomes broken, the coils demagnetize and release the armature. The spring which is shown at the end of the lever then pulls the bar up, leaving it as in the first place. The other wire from the spools is attached to the other side of the battery. It is from the clicking of this lever as it is contracted and released that we can distinguish the signals of the Morse alphabet as made by the key. Care should be taken to see that the magnet cores are kept clean and bright and not allowed to rust. Do not tamper with the magnets (spools). (See fig. 3).



Fig. 4.

41. **The Resonator** is a little wooden box in which is placed a Sounder, so that it increases and concentrates the sound, making it possible to read readily from a certain Sounder without affecting the working of other instruments. It is especially adapted for receiving operators using the typewriter and for all situations where the sound of the instrument is subject to outside interferences. (See fig 4.)

42. **The Battery** is an apparatus for generating an electro motive force, by means of chemical action. A battery in the strict sense of the word is a combination of two or more cells. These cells may be roughly divided into two classes, namely: Closed circuit cells, and open circuit cells. The gravity cell is

generally used in the telegraph service. This consists of a glass jar with the copper and zinc, with the addition of bluestone or copper sulphate and water.

43. A learner's set and a gravity battery connected together is illustrated in figure 5. A student who desires to learn the art of telegraphy, will need for practicing a telegraph key, sounder and battery. The learner's set which is illustrated in figure 6, is recommended for the beginner, and we also recommend that a dry cell be used instead of a gravity, as it is much cleaner and it can be used to better advantage. The separate instruments are preferable, because they can be placed in different rooms, that is, the key may be placed in one room and the sounder in another, if the students only have one set between them. Both the Learner's and the Separate Sets may be secured in the School. (See inside of back cover.)

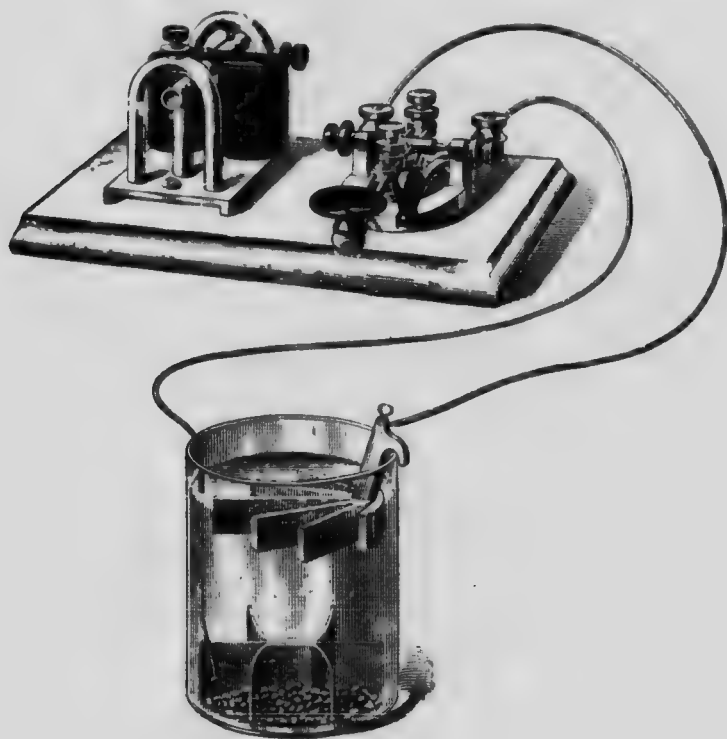


Fig. 5.

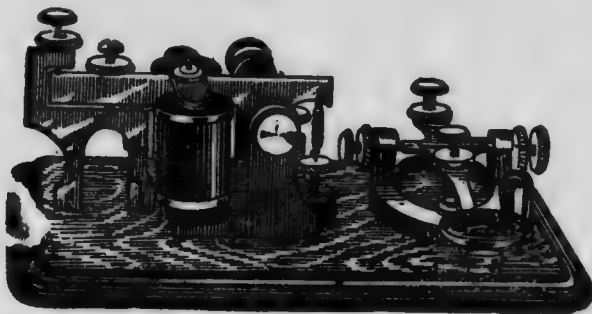


Fig. 6.

THE SETTING UP AND CARE OF CELLS.

44. Directions for setting up and taking care of a cell are usually sent with it, but for a gravity cell they will be given here. After unpacking the cell, wash the copper and zinc before putting in the glass jar; unfold the copper strips so as to form a cross and place it in the bottom of the jar. Suspend the zinc in the jar about four inches above the copper, by hooking the catch on the side of the jar. The zinc has a binding post with a hole in which to fasten a connection wire. Put the blue-stone or copper sulphate in the bottom of the jar so it will be equally divided between the leaves of the copper and pour enough water in the jar to cover the zinc. The cell must be left quietly in this manner for some time before it will be in good working order, about twelve hours will be sufficient. However, when you are cleaning the cell again, it is advisable to pour off the liquid so that you will not have to wait until this is acted upon again by the chemical action of the zinc and copper. The instructions for setting up the instrument so far as the wire is concerned are usually sent with the instrument, but in case they are not, the student should refer to the illustration given in figure 5, which shows how the wires are connected up. We recommend, however, that the student use the dry cell battery for learning with, but the instructions on the gravity cells will become very useful to you when you get into actual work with the railroad, or, in fact, in any commercial office.

CARING FOR CELLS.

45. Bluestone or vitriol should be dropped into the jar as it is consumed. Care should be taken that it goes to the bottom and not on the zinc. After the battery has been started no further attention is required except to keep it supplied with bluestone and water. Zincs should be taken out and cleaned every month; when worn out replace with new ones—old coppers and zincs to be returned to supply department.

46. **Cleaning Cells.**—The cells should be cleaned out about once every three months. To do this carefully remove the zinc, clean it by scraping with a knife and wash it with plenty of water. Pour the clear liquid into a separate jar, leaving behind the oxide and dirt. Now take out the copper, clean it and the jar, throwing away the sediment. Replace the copper, put around some bluestone, pour the clean liquid back into the jar, replace the zinc, and add enough water to cover the zinc. The battery will soon be ready for use. Some operators throw away all the liquid and put in clean water and bluestone, but this requires short-circuiting the battery for at least twenty-four hours. The fresh solution will give the best results, where time and the expense is not so important. It is a good plan to pour oil over the water in the jar. It prevents the water from evaporating, and the creeping of the salts over the edge of the jar.

EXERCISE NO. 1.

47. Write out in telegraphic symbols in a scribbling book or blank paper the characters representing the letters in the following sentences. These sentences will be found very important in practical work, and they will be explained further as to their practical application in Railroad and Commercial work. This exercise at present is to help to impress upon your memory the various characters. Always leave a margin in your book of one-half inch when writing these exercises.

Wait a minute.
Very important.
Train Reports.

Did you receive my last?
I understand.
I, or we, understand.

Where shall I go ahead?	What is the trouble?
Have you any business for me?	Train order.
Close your key. You are breaking.	A message for all.
To clear the line for orders and for operators to ask for orders.	Busy on another wire.
	Accept my compliments.
	Have you anything for me?

ABBREVIATIONS—Exercise No. 2.

48. The following list of abbreviations will be found quite useful to the student in practical work, and in writing them out at present for the purpose of getting the telegraph symbols fixed in the mind, it will serve a double purpose. These abbreviations are used chiefly for wire conversations, and are generally made by leaving out the vowels. No good operator can afford to be without them. This list is not complete, but it will serve the purpose in this book, and others will be added further on in the course for practical purposes. Write out the telegraphic symbols on a separate sheet of paper to correspond to the different words and abbreviations, and always check them by trying to read them from your own writing.

About	abt.	Conductor & Engineer.	C & E
Account	aect.	Complete	com
Acknowledge	"X"	Copy	cy
(used in train orders only)		Could	cd
Afternoon	P.M.	Dead head	D H
Agent	agt.	Destroy	bust
All right	art	Did	dd
Another	ahr or	Double Deck	DD
	anr	Engine	eng
Answer	ans	Excuse	ex
Arrive	"a"	Free on board	F O B
Baggage	bage	Freight	frt.
Barrell	brl	From	fm.
Been	bn	Going	gg
Be	b	Good Afternoon	P.M.
Before	b4	Good Evening	G.E.

Check	ck	Good Morning	G.M.
Collect	coll.	Good Night	G.N.
Collect. on Delivery	C O D	Good Bye	G.B.
Come	CM	Ground wire	G.W.

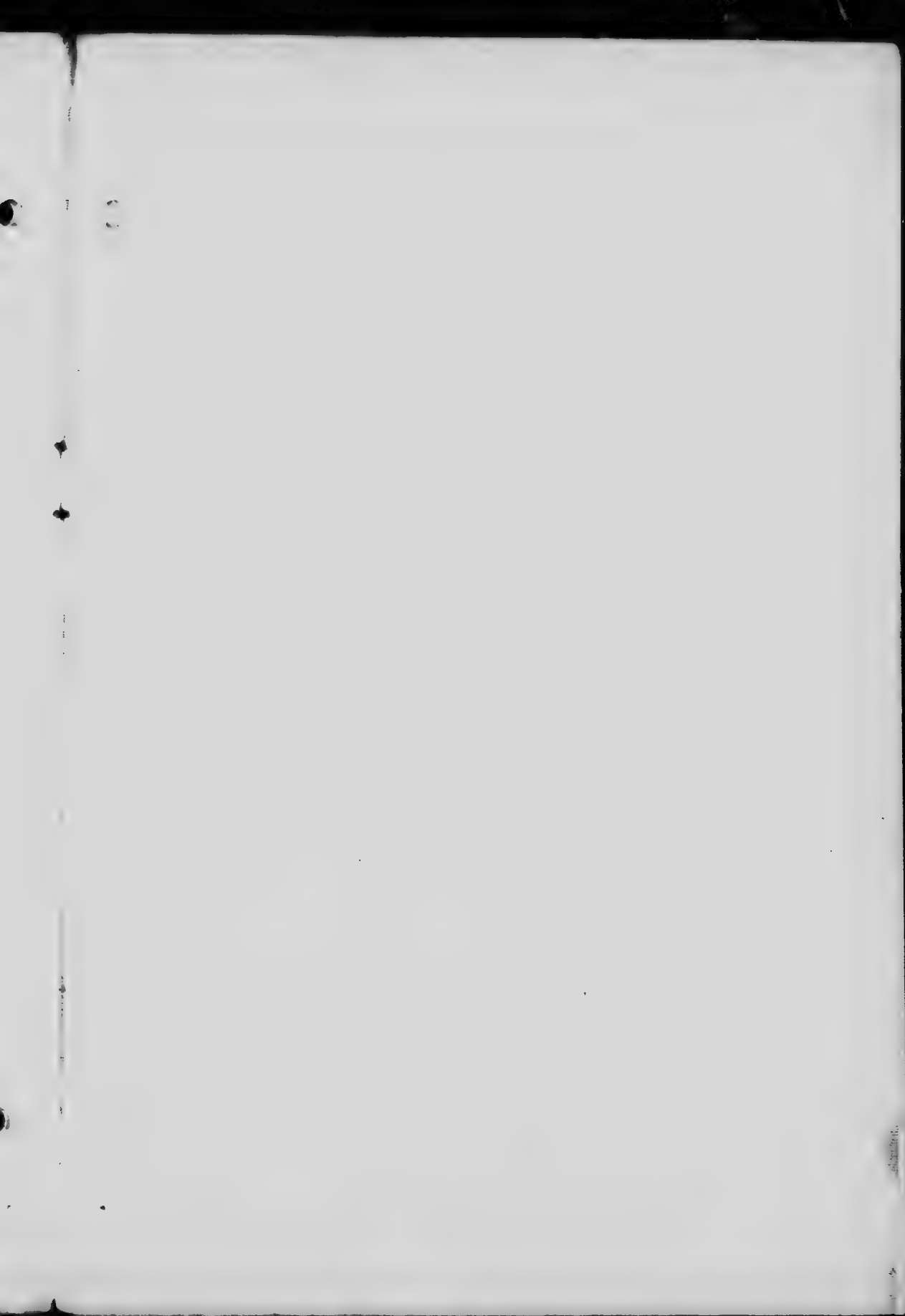
EXERCISE NO. 3.

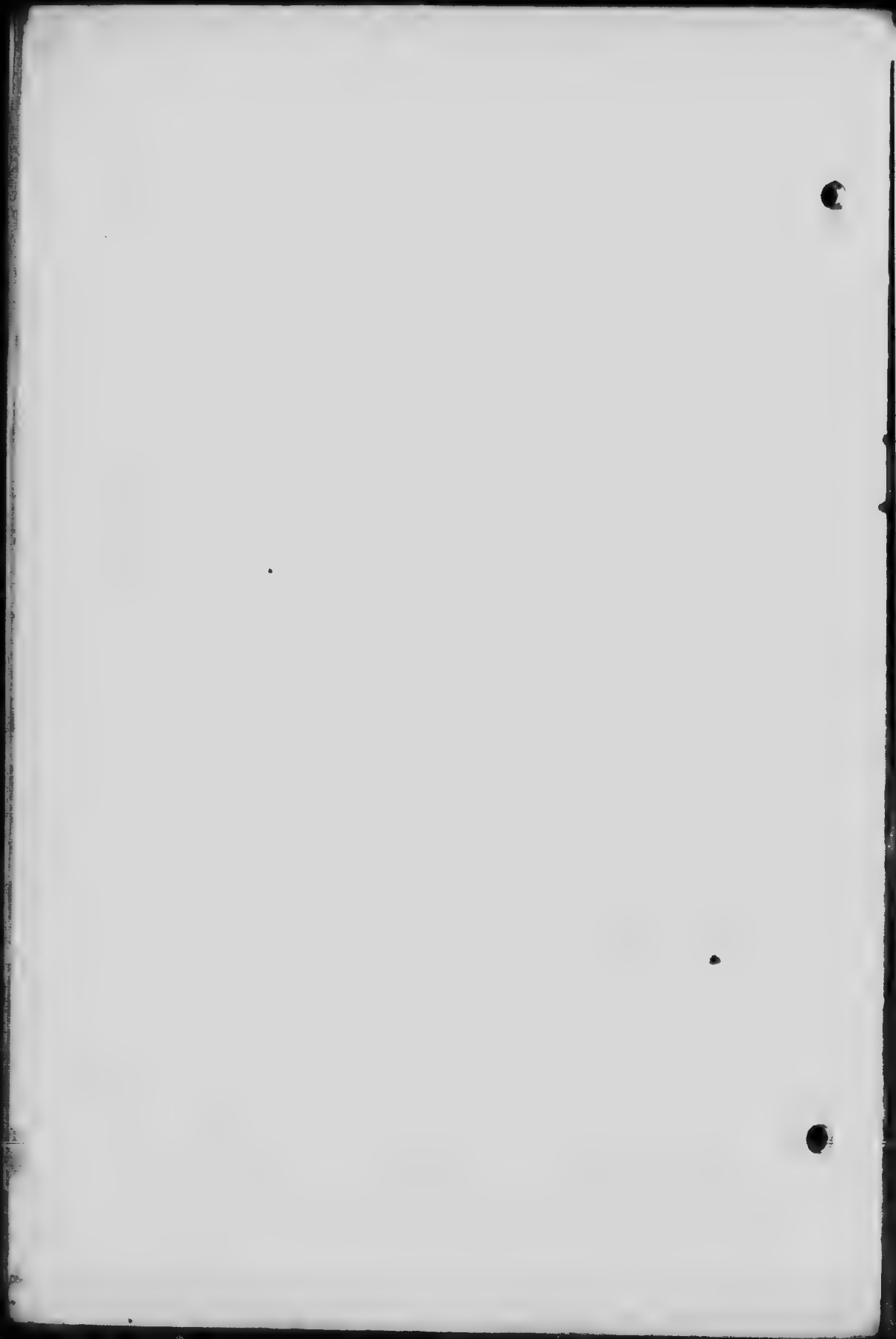
50. Write out in telegraphic symbols the following:—
A1, B2, C3, D4, E5, F6, G7, H8, I9, J0, 2, \$, cents, period, comma, K3, L7, M10, CX4, DX8, FQ2BX892, LCS213, AB2, AC1, AM7, AR1, BC2, " " " "

After writing out the exercises that have been given you, and having given the paper a general review, write out the answers to the test questions that appear at the end of this book, and hand them in, or mail them to us for criticism.

TEST QUESTIONS.

1. What is Telegraphy?
2. What is required to become a first-class Telegrapher?
3. What is the first important thing to do in learning?
4. In the practical punctuation code, what characters are used more often than others?
5. Describe the time required to make the dots and dashes that apply in general to Morse writing.
6. Illustrate a short method of reading characters.
7. What is a circuit?
8. What is a key, a sounder, a relay?
9. What is a battery? Name the two kinds.
10. How many parts to a telegraph outfit?
11. Describe in your own words how to set up a gravity battery.
12. Advise what progress you have made, and if any part of this lesson seems difficult for you.





TELEGRAPHY

Special Examination No. 1

1. (a) What is a semaphore?
(b) How are signal indications given by day?
(c) How are signal indications given by night?
(d) How is the arm displayed?
2. (a) What is a disc signal?
(b) How are signal indications given by day?
(c) How are signal indications given by night?
3. (a) What is a target signal?
(b) When the target signal is horizontal with the track, what does it indicate by day?
At night what light would be shown when in this position?
(c) When the signal is parallel with the track, what does it indicate, and at night what light is shown.
(d) Whenever fixed signals are used, where will rules governing their observance be found?
4. When should fixed signals be lighted? 403.
5. (a) What is the station protection signal?
(b) What is the normal indication?
(c) How are signal indications given by day?
(d) How are signal indications given by night?
6. (a) When a station protection signal indicates stop, how will a train be governed?
(b) How may it then proceed?
7. (a) When flag stop signals are of the semaphore type, how are indications given by day?
(b) How are indications given by night?
(c) How will trains in either direction be governed?
8. Where are special instructions to be found?
9. Do you understand that supplies and material must be economically used and cared for, and that scrap and other material of value must be turned in to the Company?
10. When accidents happen involving injuries to persons or damage to track, etc., what are your duties? Q.

DOMINION SCHOOL OF TELEGRAPHY AND RAILROADING

TELEGRAPHY, SPECIAL EXAMINATION NO. 1—Continued

11. What is a yard engine? A Pilot?
12. (a) What signal is used to stop a train only at a flag station indicated on its schedule?
(b) When necessary to stop a train at a point that is not a flag station on its schedule, what signal must be used?
13. How are trains superior by class? 72.
14. When a train loses both right and schedule, how may it proceed?
15. What must a train obtain before leaving its initial station on any sub-division or passing from double to single track? 83.
16. (a) May trains of one schedule pass trains of another schedule of the same class?
(b) May extras pass and run ahead of extras? 85.
17. (a) How much must an inferior train clear the time of a superior train in the same direction? 86.
(b) How much must an inferior train clear the time of a first-class train in the same direction?
18. At meeting points between trains of different classes, how will the inferior trains be governed? 89.
19. (a) May two or more sections of a train be run on the same schedule? 95.
(b) What authority is required for a train to display signals for a following section?
20. What authority is required for running an extra train? 97.

SUPPLIES FOR STUDENTS.

We always keep on hand the necessary supplies, so that students need not go outside the school to get anything they require in connection with their studies.

A student beginning his course in the Day School pays \$2.00 for his instruction books and a supply of stationery. The stationery consists of scribbling books, writing pads, speed examination pad, two pencils, pen holder, two pen points, in addition to having the regular station forms which are supplied in the stations. The message blanks, etc., are not required until such time as a student gets in the senior class.

The following articles may be purchased any time through the school:—

Telegraph Learner's Outfit, including dry cell battery and wire	\$3.00
Individual Telegraph Key (Leg), each.....	1.75
Individual Telegraph Key (Legless), each.....	2.25
Individual Telegraph Sounder, each	2.75
Bell Wire for connecting instruments, 25 feet for.....	.15
Blue Vitrol (for Gravity Battery), per lb.....	.15
Jar for Gravity Battery	.40
Gravity Battery, complete, with copper, zinc and Blue Vitrol, 1 lb.....	1.25
Dry Cell Battery, each	.25
Fountain Pens, Special	1.50
Styluses for writing train orders, each	.25
Scribbling Pads, each	.05
Examination Pads (3 for 25c) each	.10
Pen Holders, each	.05
Pencils, 2 for	.05
Twentieth Century Telegraph Manual, by Frederick L. Meyer, Chicago	1.50
Penmanship Book, Part 1	.15
Penmanship Book, Part 2	.25
Mecograph (A Hand Sending Instrument)	9.00
Automatic Telegraph Transmitter (for home study purposes)	25.00

